Synopsis

On

Readiness of Youth towards 5th Industrial Revolution in India

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In

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Under the supervision of

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1. Topic of Research

Readiness of Youth towards 5th Industrial Revolution in India

2. Introduction

Economic development of a country is significantly influenced by human capital, where the central idea is skill and knowledge (Stern, 1991). Economic development is a replica of Industrialization as industrial sector converts the natural resources into economically worthy goods through process of production, which ultimately results in consumption and income generation, and thus stimulates the economy. So, a strong connection between Industrialization and human skills is obvious. Owing to intensive research &development, innovation in technologies; India has been witnessing sharp change in Industrial working in the form of industrial revolution. Industrial Revolution, the term was initially used by French writers but was globally brought into light by Arnold Toynbee, a British economic historian in the latter half of the 18th century. The revolution brought in drastic transformation from rural and agrarian societies to the industrialized ones. Economic development goes along industrialization. New machines and technological intervention, were the hallmark of the new revolution (History, 2009).This was the welcoming of the first Industrial Revolution, since then, India is witnessing gradual twists from Industrial revolution 1.0 (18th century) to Industrial revolution 5.0(21st century). These revolutions signify sharp changes in the technological aspects in industry, innovation in the economy and furthermore radical shift in society over time (Bezanson, 1922). There have been multiple perceptions of the interpretation of the term 'Industrial revolution'

depending on time and geographical boundaries. Some writings associated industrial revolution with the growth in macroeconomic variables and some related it with technological improvisation. There were also some authors who claimed that new Industrial revolution brings structural change in the economy, change in distribution of employment, and amelioration of living standard (Hudson, 2014).The modifications, discussed by different writers, have immediate implications on producer sector, consumer sector and subsequently they engulf entire economy and pace up development of the economy. The inmost idea which could be derived from various perceptions of IR is that, the technological innovation is the essence of rapid transfiguring of new revolutions. Technological innovation comprises all technologies like mechanical, electronic, Industrial/Manufacturing, and Medical and Communication (Aunger, 2010).These technologies have enormous potential to bring drastic change in the living style and working style of youth. Amidst any ongoing stage of industrialization, youth can be a potential game changer. For developing country like India where youth form a significant part of the population, the new Industrial revolution can create lucrative opportunities for the youth. By now India has discovered 4 Industrial revolutions and can foresee the coming of 5^{th} Industrial Revolution.

2.1 Human Skills Crucial Ingredient for Industrial Revolution 5.0

5^{th}Industrial revolution is the ultramodern gift of technological advancement which would bring back humans as lead actor in the Industrial sector. Globally IR 5.O has already become part of vision among Industrialists; but India is yet to welcome the reformation. As of now, India is tuning into the 4^{th} Industrial revolution. IR 4.0 is the foundation pillar of IR 5.0. Technologies which mingle together to form IR 4.0 are - Artificial Intelligence, Robotics, Cloud Computing, Big Data, Internet of Things, 3D Printing and many more. **IR 5.0= IR4.O (Technologies) + Humans Dexterity**

Co-partnership of humans and robots/machines which is called COBOT would result in extraordinary high productivity, creative designing and customization of products and services. The collaboration will lead to inordinate transformation of manufacturing, Telecommunication, IT industry and also Medical Industry. Additionally Biological Resources would be used in IR 5.0 to raise sustainable economy by balancing ecology, industry and economy. The bone of contention is

that-IS INDIAN YOUTH READY with sufficient know-how; and skill set, to gladly receive IR 5.0

2.2 Awareness and Preparedness of youth for Industrial Revolution 5.0

Certainly humans with better skills can pace up any industrial revolution (Sqicciarini & Voigtlander, 2015)and 5^{TH} IR is all about humans. Humans as superior resource would work along the machines. So, the main focus of the revolution on human resource has created abundant scope for bright future of Indian youth. A report by ministry of statistics and programme implementation stated that India has largest share of youth population in the world and would continue to be a youth nation for 20 years. Youth being a zealous and innovative segment, is the most valuable human resource for economic development of the nation (Verma, et al., 2017). National youth reports claim that youth is the most potential human capital for the nation. The major task is to tap the untapped energy and to increase the potential of youth, so that they actively participate in the new Industrial Revolution. It wouldn't be wrong to say that, the 5^{th} industrial revolution would be, of the youth, for the youth and by the youth but only if the youth is aware and prepared (Verma, et al., 2017).

India is nearing the 5^{th} stage of revolution, where machines would assure high quality, low price and humans would emphasize customization. New revolution in the youthful country can be well recognized when the youth is empowered with all the ins and outs of new technological transformation. The major problems are- Is youth aware of the 5^{th} industrial revolution? Is youth prepared with adequate soft skills for the new revolution? Also the youth would be emerging Industrialists, potential employees, socially responsible citizens and ultimate consumers of high tech goods and services. Global experiences of other countries might help India in doing SWOT analysis of readiness of Indian youth. Knowing the current perception of youth towards 5^{th} Industrial Revolution would give 360 degree vision regarding future of the new revolution and it would enable the government, industries, corporate and educational institutions to work on the changes required in policy framework. Only if youth is sufficiently aware and adequately prepared, the complete benefit of new revolution can be availed.

3. Review of Literature

The current literature divulge the evolutionary change from the first Industrial Revolution based on steam power and water to the fifth Industrial Revolution which showcase unprecedented technological advancement. The fifth Industrial Revolution is about robots and humans; an unwearied combination of digitalization and brainpower of men. The novel revolution is about ubiquitous computing and the most powerful computer i.e. human brain.

The evolution at a glimpse-

S. No.	***EVOLUTION***	***DESCRIPTION***
1	First Industrial Revolution (1780) -STEAM POWER	Industrial production was dependent on steam power and water (Brulend & Smith, 2013)
2	Second Industrial Revolution (1870)-ELECTRIFICATION	Manufacturing evolved from steam power to electrical energy. (Bloem, Doorn, Duivestein, Excoffier, Maas, & Van, 2014).
3	Third Industrial Revolution (1970)- AUTOMATION	Information technology system, Automated production using robots along with electronics which would result in advent of innovative technologies, up-skilling of employees and better productivity. (Demir, 2019)
4	Industry 3.5(1980) - GLOBALIZATION	Movement of production overseas to take benefit of economies of scale (M.Boughton, 2002)
5	Fourth Industrial Revolution (2011) –DIGITALIZATION	Internet of things, cloud computing, robotics, Big data, 3D Printing. Transformed from physical to cyber physical system (Bloem, Doorn, Duivestein, Excoffier, Maas, & Van, 2014)

6	Fifth Industrial Revolution (upcoming Reality) – PERSONALIZATION	1st aspect of IR 5.O is Cobots (collaborative robots) they imply humans (creativity) and machines (speed accuracy) co-working using technologies of IR 4.0
		2nd aspect is Bio-economy (i.e. Use of biological resources / Biotechnology in the economy for the production of goods, services,, or energy to ensure sustainable society) (Rossi, 2018)

3.1 Industrial Revolution 4.O and Associated Technologies

The term Industry 4.0 originated in 2011 by German government as the output of a project in High tech strategy, marked by improvement in information technology in manufacturing sector (Moore, 2019). The working group of IR 4.0 was the pioneer of trendy term IR 4.0. The final report was presented publicly at Hannover Fair and since then the revolution is gaining eminence worldwide (Ustundag, 2017). According to Forbes, Digitalization is the thrust behind the IR 4.O (Nagy, 2018). Digitalization or Digital Transformation is converting analogue information into digital form (Schreckling, 2017) and the information can be maintained in a uniform digital format and further electronic processing can be done (Parviainen, 2017).As a result, it is observed that irrespective of time and location, data can be made available, at least cost that too with utmost ease. Digital Technologies incorporate technologies like SMAC (social media, mobile, analytics and cloud resources) (Khin, 2019) and also involve emerging technologies. (Schreckling, 2017). The emerging technologies are-

- **Artificial Intelligence**- Ability of digital computers or machines that are programmed to exhibit human like intelligence. AI is based on algorithms which govern machines to mimic like human mind. E.g. - Self Driving Car, ATM
- **Internet of Things**-It is a system of interlinking computing devices, mechanical devices, digital machines so as to enable easy exchange of data without the requirement of man to man or man to computer interaction. Further extensions are

Internet of Bodies in which chip may be implanted in humans (Smith, 2008) and **Internet of everything** E.g. Amazon Alexa.

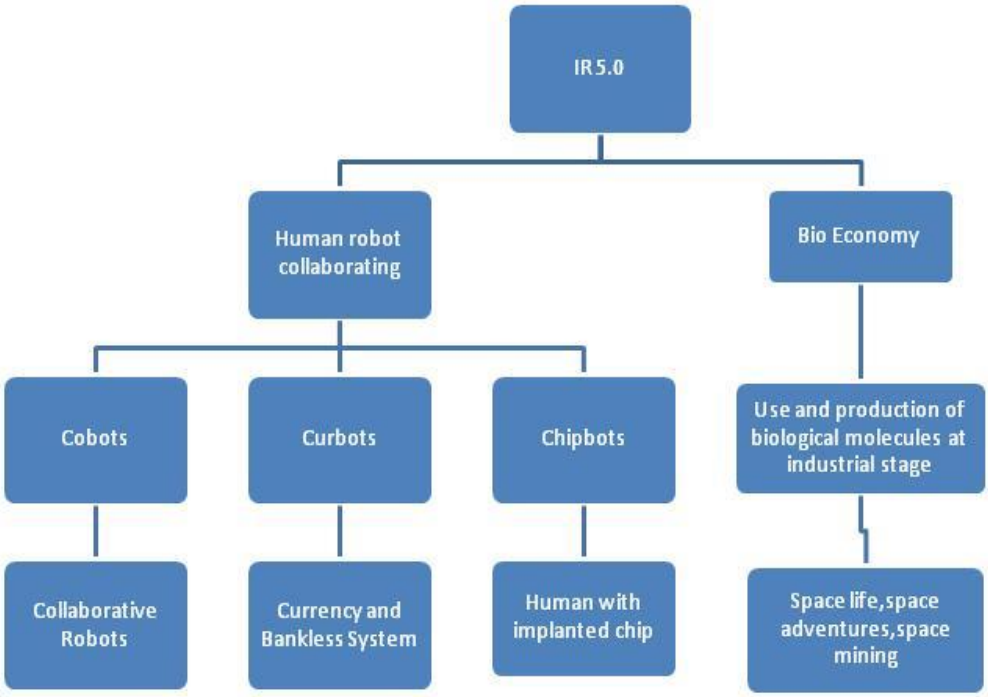
- **Block Chain-** Database which is distributed globally over thousands of servers. It is a public ledger of all digital transactions performed by the participants. The data is split to blocks so that transactions can take place digitally in most secured way E.g. Crypto currency (Crosby, 2016).
- **Big Data**–It is a field to analyze and systematically extract information from huge data. Big Data is the sum total of personal, commercial, geographical, behavioral data which available on digital networks like internet, mobile phone, etc. and can be exploitable as raw material, e.g. the new ventures rely on big giants Google, Facebook, Apple, Amazon,IBM, etc. which manages bulk data on their clients and use algorithms to convert this data into exploitable information.
- **Cloud Computing-** It is transacting IT services over internet generally on paid bases. Digital resources are shared, stored virtually and can easily be accessed. E.g. exchange of databases and software over cloud. Google drive can be example of personal cloud.
- **Robotics-** It is a research field, where smart machines are designed to substitute human tasks. In dangerous situations where humans life would be at risk, robots take the charge, e.g. for bomb detection.
- **3D Printing**-Also called additive manufacturing. It is a technology in which 3d objects are created by joining material using computer control .E.g. Ford uses the technology for rapid prototyping, experimenting parts and creating fixtures for manufacturing. Applications are also extended to used for jewellery designing, medical sector and many more.

Surprisingly, these technologies were not developed for IR 4.0, but the revolution was meant to merge the multiple abilities of all these technologies to convert intelligent manufacturing to smart manufacturing (Yao, 2017). The immediate benefits of IR 4.0 are better productivity, enhanced efficiency, greater returns on investment and better customer experience (Moran, 2018). The purpose behind discussing these technologies is that, these would form groundwork to erect the structure of 5^{th} Industrial revolution.

3.2 Envisioning Industrial Revolution 5.0 (IR 5.0=IR 4.0 + Human

creativity)

IR 4.0 focused on machines whereas in IR 5.0 accentuates human creativity, personalized production and improvement in the living standard (Friend, 2019).By now in every successive revolution from 1.0 to 4.0 there was dehumanization, as human work had been consistently isolated from machine work, hence in the upcoming revolution one can foresee the coming back of humans with charm of creativity to compliment the machines and mass customization of products and services (Sagan, 2020). Traditional robots weren't designed to work with the simultaneous involvement of humans but the new revolution is coming with the concept of collaborating speedy robots and creative humans. Collectively the alliance is called as **COBOTS.** Collaborating humans and robots would rule the coming era. Robots would make the products as programmed and thereafter humans would customize the final output. In other words high tech robots using technologies of IR 4.0 (Artificial Intelligence, Big Data handling, 3D Technologies, Robotics) would take over dangerous and monotonous tasks and humans would creatively customize the output leading to personalization of production. This way the transition from IR 4.0 to IR 5.0 would create lucrative job opportunities, and also strengthen relationship with consumer (Accenture). Some experts believe that IR 5.0 has already started with the coming of crypto currencies. Additionally, intensifying human computer interaction provides concrete evidence of the beginning of new human centered revolution. In fact Pandemic COVID-19 is laying foundation for next revolution and fastening the pace of IR 5.O as the world is turning digital. IR 5.0 will not only be machine set with algorithm but way ahead and take a role of ideal human friend. Currently IR 5.0 encompasses Human Robot collaborating and Bio Economy. The current scope of 5th Industrial Revolution (Hanif, 2020) is depicted as-



Source- (Hanif, 2020)

The changes in IR 5.0 can be gauged with idea that, sensors would be installed on devices which will be able to connect to Wi-Fi allowing mobile devices to continuously synchronize with smart medical devices like pacemakers, insulin pumps. Researchers also mentioned of making synthetic DNA. According to European commission, Bio economy will comprise production of renewable biological resources. From the transitions - Manufacturing, agriculture, forestry, food paper, chemical, biotechnological, energy industries are likely to be transformed.(Demir, 2019).

The new industrial revolution would bring changes like, more usage of intelligent devices with computing capabilities, internet connection and webcam. It would unite human, machines and software to solve the problems digitally. The smart high tech devices would be successfully installed in Industrial, commercial, educational and government sectors for growth and development (Saduki, Y.Wang, Cui, & Musa, 2017). Technologies in IR 5.0 would help in handling big data digitally; artificial intelligence would enable data analyses by extracting the most important information. Collaborative robots would automate the production task with great speed, utmost accuracy and finest quality (Bloss, 2016). Robots would effectively work where probably humans can't, owing to safety measures, thus eliminate extra

cost, human errors and wastage as robots would carry out routine tasks with utmost precision and quality (George & George, 2020). Smart sensors could play crucial role in monitoring equipments and humans. At the workplace the sensors would not only improve quality of output but can also help in sensing heart rate and oxygen level of people (Aygun & CagriGungor, 2011). IOT would connect all machines and devices to the internet which would allow exchange of data instantly, this technology would be applied to industries, medical field, and sustainable agriculture. The extended version of IOT is 'Internet of everything', where all devices, processes and even humans would be connected with the internet, this interaction would give boost to business and this would have medical applications too like pacemakers and implanting chip. The driverless cars; high tech machines; tracking of the working of inner organs; and robots doing surgeries (Haleem & Javaid., 2019b) that too in less time are the gifts of artificial intelligence. 3D printing, an amazing technology would enable customized output by manufacturing the prototype digitally (Ali, Batai, & Sarbossav, 2019). The technology could help in repair of aerospace, military equipments and also making digital models in education institutions. The applications of 3D, 4D and 5D printing are in medical field jewellery designing, textile industry and construction Industry (Javaid, Haleem, & Kumar, 2019). Cloud computing is icing the cake, as with the technology, the companies would offer cloud based designing, consequently consumers can build the customized parts without purchasing 3D printers. Synchronization of all the technologies innovatively in various combinations by human, for the comfort of human in daily lives is the ideology behind 5^{th} IR and if the technologies are readily adopted by youth, it would tremendously benefit the nation.

3.3 Readiness of Indian Youth for 5^{TH} Industrial Revolution.

India has successfully entered the arena of IR 4.O by an initiative by EEPC in association with Department of heavy Industry which is called SAMARTH-UDYOG BHARAT 4.0 to take India on the path of "Smart and Intelligent Manufacturing". SAMARTH stands for Smart Advanced Manufacturing & Rapid Transformation Hub, include technologies and trends like Industrial IOT, additive manufacturing (3D Printing), advanced robotics, artificial intelligence, augmented reality, cloud computing, cyber security, simulation, system integration, analytics etc (Ghosal, 2019).Globally tech visionaries have started talking of IR 5.0. Universal Robots

Chief Technology Officer Esben H. Østergaard has stated that IR 5.0 is the need of hour for its ability to customize products with involvement of humans (Atwell, 2017) .Also (Hanif, 2020) indicated the hasty advent of IR 5.0 due to widespread pandemic, because willingly or vehemently globe is adopting digital pathways. Dr.Marcell Vollmer Chief Innovation officer at Celonis said IR 5.0 is already an emerging trend. India as a developing nation can't shrug off such a paradigmatic shift that is approaching. IR 5.0 is a buzz word globally. Researchers believe that IR 5.0 is already started with application like crypto currencies, implantation of chip in human body. Researchers claim that 5th IR has taken roots and in near future, the combo of man power and machine power would lead to record breaking development of industrial sector. Collaborating man and machines at work site would reduce physical waste, social waste, urban waste and process waste; resultantly this revolution would do well to the economy and environment (Shelzer, 2017). IR 4.0 does contribute to declining production cost, logistics cost and quality cost but the entire revolution overlooked human cost. Threat to employment was the cause of concerns of IR 4.0 as it emphasized machines, so the 5th stage of revolution would bring forth the human version of IR 4.0 which would give high level jobs and satisfaction while working with machines. In IR 5.0, humans and robots will together lead to exceptionally high efficiency and customized production (Nahavandi, 2019).

When thinkers globally are already talking of the expanse of upcoming IR 5.0, it is no wrong to say that the new revolution is ushering. Moreover IR 5.0 is not anonymously new but the revamped version standing on the pillar of IR 4.0 technologies with dominance of humans over machines. Further researchers have been discussing human and computer interaction from long so IR 5.0 is just a better version of the human experience with technology (McCarthy, 2004). It would be interesting to say that humans and machines will dance together in the new revolution. IR 5.0 has already developed a base in India. Amazingly, IR 5.0 related technological changes are already happening in India. Bajaj Auto Ltd. first implemented the use of collaborative robot in 2010 (Bureau, 2019). To overcome the problems like bank robbery and black money, India is going currency less. In currency less banking, money is exchanged electronically without the need of hard cash, using SMS banking technology (Rasu, Kumaresan, Manoshrudhy, & Sundaram, 2014). Implanting pacemakers started in AIIMS New Delhi in 1968, and in future the chip in body would enable access to office, home, restaurants, E-tickets.

Moreover chip in the brain would mechanize the working of brains to compete with high tech machines (Karam, 2019), unbelievably the chip might help to study thoughts. Sooner or later IR 5.0 would be fully recognized in the nation with various challenges and opportunities. The question is, whether the Indian youth has sufficient skills to deal with the revolutionary change. Global and Indian experiences pose certain skill gaps, which if timely addressed, the youthful country like India can use the strength of its youth as opportunity to explore new revolution soon.

A study in Europe came up with following impediments on the way of transformation -

a) Lacking digital competence,

b) Missing technology and infrastructure

c) Missing skills and guidance

Skill gap study was conducted by Deloitte in US revealed skill shortage and they came up with five skills needed to match up the technological innovation, they were (Rithu Thomas, 2018)

1) Technology and computer skills

2) Digital skills

3) Working with tools and techniques

4) Programming skills for robots and automation

5) Critical Thinking

In the 5th Industrial Revolution, humans are the kings who have jewels of technologies like AI, Robotics, 3D Printing, Big Data, Block Chain, and IOT which can be collectively used in various combos to give innovative results in all the sectors of the economy. Machines would be technically advanced, hasty and accurate but when it comes to potential of youth in customizing the technologies for business growth, it is revealed that youth is behind in the skills. A report in Malaysia reveals that out of 2, 00,000 graduates, 40.5% are unemployed due to lack of soft skills. Having right knowledge and degrees is not adequate but having right skill set and attitude is essential. The report emphasized the following soft skills (Nair, 2018) -

- Communication skills
- Proficiency in English
- Competency in foreign language
- Leadership skills

(Ungureanu A. , 2020). Alexandra Veronica rightly suggested adaption of 4Cs

paradigm from education system to comprehensive growth of global economy which is constantly witnessing changes. The 4Cs in the form of four crucial skills in the era of transition from IR 4.0 to IR 5.0 are-

- Critical thinking
- Communication
- Collaboration
- Competition

The skills, given by Prof. Yuval Noah Harari, emphasize the teaching of the 4Cs because among all skills the skill which is of utmost importance is to cope with change, to learn new and to maintain balance of mind in unusual situations (Harari, 2018). As big data, IOT, AI would result in huge data but critical thinking is must to extract relevant information and effective communication is required to deliver the results. Similarly collaboration of man and machines, man and man, machines and machines is important for a healthy business ecosystem and sustainable growth. Creativity adds value to the new technologies by innovative applications. Youth as human capital can do wonders with the skills in IR 5.0. Owing general soft skills is more important over technical skills (Ungureanu A. , 2020).

In the light of new technological revolution, the ministry of education Malaysia also stated, that real talent is not machines but the partnership of men and machines. It focused on strong social skills like persuasion, emotional intelligence, and collaborative skills over narrow technical skills. Malaysian education blueprint included in their content (Selamat, Alias, Hikmi, Puteh, & Tapsir, 2017)- Leadership skills, Language proficiency and Thinking skills apart from knowledge and ethics.CEO of Apple inc. Tim Cook also said “I am not worried about AI giving computers the ability to think like humans but I am more concerned about people thinking like computers”. The statement clearly indicates the significance of human skills over machines.

IR 5.0 is the developed version of IR 4.0 where there is invasion of digitalization based technologies in human life so that humans, machines and robots can cooperate with each other, making work and life easier. The study suggested some soft skills like-Interpersonal (ability to overcome conflicts, negotiation and cooperation), Communication, Leadership skills and Work ethics for generation Z (the generation which is exposed and surrounded by ICT based technologies from, birth and are highly dependent on it).The Soft skills include values, motivation, habits, character,

attitude and behavior. These soft skills are affected by thoughts, words, actions and behave (SE, SI, SE, & SI., 2019). These are the skills which would prepare the youth for technically more advanced and human centered 5th IR. The rapidness of technological up gradation makes the knowledge outdated soon, so different competencies are needed to be developed besides technical and hard skills, they are-cognitive skills, complex problem solving skills, social skills, system skills, resource management skills etc (Van Dam).World economic forum gave 10 skills to be possessed by workforce in the new revolution –Complex problem solving skills, critical thinking, creativity, people management, coordinating with others, emotional intelligence, decision making, service orientation, negotiation and cognitive abilities (Grey, 2016).

Latest technologies demand youth to be more social and soft in their behaviour, the soft skills encompass team-work, communication, creative thinking and problem solving, project management, leadership (Turner & Muiholland, 2017).

The present scenario of in India is-non-availability of skill set to adopt the automation. The major challenges include soft skill gap like lacking leadership skills, communication skills along with other issues like insufficient digital infrastructure, High cost and security issues (Jadhav & Mahadeokar, 2019).Goldsmith skill inventory involve 15 skills involving -self-management, interpersonal ,communication, creativity, critical thinking , team-working skills, the ability to work under pressure, willingness to learn, attention to detail, taking responsibility, planning and organising skills, insight, maturity, professionalism and emotional intelligence (Teng, Ma, Pahlevansharif, & Turner, 2019). These skills if effectively incorporated by youth can well equip them with soft skills to take lead role in 5th Industrial Revolution.

According to MSDE report (2015) only 5% of the total workforce has undergone formal skill training as compared to 68% in UK, 75% in Germany, 52% in USA, 80% in Japan and 96% in South Korea. As per India skill report 2018, 40% of the youth coming out of higher education institutions are employable but the industry complains of lack of skilled manpower for the youth. A skill gap study by NSDC estimates incremental human resource requirements of 109.73 million by 2022 in 24 key sectors of the economy. The National Employability Report (2019) by ASPIRING Minds estimated that 80% of engineers are not employable by any Knowledge economy (National Employability Report, 2019).The Prime minister of

India invited the nation to pledge to make India, skill capital of the world, which is possible only when youth is adequately aware of the skills they possess and critically evaluate the skills where the youth is lacking. The MSDE report mentioned the core skills-soft skills and interpersonal skills (Skill India Annual Report, 2018-2019)

India has 65% population below age of 35, in new revolution, jobs won't be replaced by robots but workplace would be bigger with higher responsibility to handle with different skill set, it is necessary to prepare the youth to encounter the upcoming technical age with required knowledge and skills. The report "World Bank Group Flagship Report" 2019 titled "The changing face of work", came up with the finding that the citizens of the European Union positively relate the presence of technology in the workplace. Two third of the respondents believed that technology would positively affect society and quality of life (Asif Islam, 2019).According to M.D.Kente, Government will have to invest in human capital, especially in areas like cognitive skills, social behavior and self-efficacy, to equip future workforce to contribute maximum in the upcoming revolution (Kenta, 2019). Also lifelong learning attitude would be of great help. These challenges and recommendation in international as well as national studies would benefit India a lot in advance preparation for the IR 5.0.

4. Research Gap

First of all there is meagre Indian literature on IR 5.0 which is nearing us. Since IR 5.0 is the coming future, knowledge regarding it is of utmost importance. IR 5.0 would come with lots of opportunities. The opportunities can be fully exploited only if the youth human capital which is brimming with enormous potential is equipped with sufficient skill set (soft skills) and political support. To achieve the goals sufficient investment in human capital is required in the form of -better educational policies, Skill training programmes by government and availability of digital infrastructure. The pre-requisite for all the above mentioned efforts are, availability on information on the current status of -awareness regarding technological innovations brought by 5^{th} version of Industrial Revolution and perception regarding the soft skill sets possessed by youth. As researchers can critically analyze the experiences of other countries and can contribute some significant literature. This way India can brace itself for the upcoming challenges and get timely equipped with

sufficient resources like skills, knowledge, and infrastructure to welcome the new revolution Industry 5.0.Consequently the new revolution can ensure better living standard to the society.

Current review of literature gives the following soft skills which are fundamental for youth, to embrace the technological advancement brought by 5^{TH} IR. These skills would not only enhance the human capital but also empower the youth to implement the new technologies for the greatest good of humanity, society and economy. Thus the new IR would push the economy to the new level of growth where youth is playing the lead rule as the owner of powerful soft skills. These skills obtained from the review of literature are-

1) Communication Skills
2) Cognitive Skills
3) Collaboration
4) Creativity
5) Critical Thinking
6) Decision Making Abilities
7) Digital Skills
8) Emotional Intelligence
9) Interpersonal Skills
10) Lifelong Learning Attitude
11) Leadership Skills
12) Problem Solving Skills
13) Proficiency in Language (English +Foreign)
14) Social Skills
15) Time Management Skills

There are studies reflecting need of hard skills, knowledge of computer coding, programming languages but the most important skills called soft skills are overlooked. Drawing attention of youth, educational institutions and government towards the soft skills can be of great help towards paving way for the fifth Industrial Revolution.

5. Rationale of the study

For economic acceleration of any country, Industrialization has got a key role. Industrialization is progressing with advancement and innovation in the technologies. Modernity in technologies keeps triggering new levels of revolution in Industrialization. Currently we are on the threshold of the 5th Industrial Revolution. India being a developing country ought to move along the flow by adopting new ways of life and work in the light of innovative technologies. The adoption includes friendly usage of Artificial Intelligence, Robotics, 3D (4D, 5D) Printing, Internet of Things, Big Data, Cloud Computing and many more. Knowing the fact India has huge youth potential, the strength of youth can be boon towards acceptance of new revolution. Youth has enormous capabilities but the literature manifest the lack of soft skills and insufficient infrastructure which is keeping them behind in the race. The current study aims to reflect the expanse of IR 5.0 and furthermore put forth certain soft skills which is hindering youth from actively participating in the new revolutions. If youth, Industrialists and government recognize the inter-linkage of soft skills and hasty adoption of the novel revolution, the skillful youth human capital can push forward Indian Economy to compete globally by adopting the 5th Industrial Revolution.

Thus the proposed study would aim to fulfill the gaps by uncovering mysterious 5^{th} industrial revolution and bring into light the soft skills essential to fully recognize the new revolution. Hence the study **"Readiness of Youth towards 5^{th} Industrial Revolution in India"** is taken for current study.

6. Objectives of the Study

As the 5th Industrial Revolution is nearing, there is need to acquaint and prepare the youth, so the following objectives are framed:

1. To study the awareness of Youth in India regarding the technology used in 5^{th} Industrial Revolution;
2. To identify the factors affecting preparedness of the youth in terms of soft skill set required for 5^{th} Industrial Revolution; and
3. To study the relationship between awareness and preparedness of the youth for

5th Industrial Revolution.

7. Limitations and scope of the study

The limitation of the proposed research study would be that only metro cities in India are chosen as the sample area. India is a youthful country, so awareness and preparedness can be explored in regions as well. The current study revolve around the soft skills as prerequisite for youth to embrace the new revolution, the other aspects like hard skills, availability and cost of digital infrastructure, ethical concerns and security concerns can also be studied in the light of 5th Industrial Revolution. The study will help Government, industrialists and educational Institutions to strategize management of human youth capital most efficiently.

8. Research Methodology

Research methodology is a systematic analysis of methods in the field of study. It is a theoretical framework for the conduct of research. It provides a path to find out the result of a given problem. Methodology answers the "How" question, it elaborates how meticulously the researcher undertakes the research process to adequately address the research problems. It comprises the elements like - what data to be collected; whom to collect data from (sampling); methods of data collection and analyses of the collected data.

a) Research Design

The design of the proposed research work would be exploratory cum descriptive in nature. The core of the study will be to uncover the 5th Industrial Revolution which is on the threshold. The study aims to reveal the awareness of the 5th Industrial Revolution among the Indian Youth and to explore the preparations of the youth in terms of soft skills.

Type of Data

To pursue the study and achieve objectives of the proposed study Primary data and Secondary data would be considered. To collect primary data, questionnaire would

be designed and to collect secondary data, research papers, reports, and journals would be referred.

b) Sampling Plan

Sample Unit: In accordance to the objectives of the study, samples would be drawn from the Indian youth. Youth in the age group of 15 to 29 would be involved in the study plan.

Sample Size: The study intends to conduct a survey on sample size on approximately 1000 young respondents selected on the basis of availability of respondents in India as per the requirements of the study.

Sample Area: The sample would be drawn from youth from metro cities in India.

Sampling Technique: Non-probability sampling technique using judgmental and convenience sampling would be used. All the sample units would be contacted personally in order to have first-hand information.

Statistical Tool

To analyze the collected data, descriptive statistics would be used, and the statistical tools which would be latest and relevant will be applied as per the availability of data. The usage of statistical techniques for data analyses would depend on the type and nature of collected data.

c) Research Instrument

A structured questionnaire would be prepared to collect the data.

The above proposal of the study is tentative in nature. It may change as for the requirement of the study.

9. Chapters Scheme

Chapter 1: Introduction

This chapter would introduce the 5th Industrial Revolution as the modified "human version" of the 4th Industrial Revolution; the study would outline the significance of soft skills among Indian youth, to acknowledge the new revolution.

Chapter 2: Review of Literature

This chapter would review the existing literature related to the 5th Industrial Revolution and skill gaps. It would assess relationships of skills and successful recognition of the 5th Industrial Revolution. It would end with the research gap existing in the available literature.

Chapter 3: Research Methodology

Third chapter would highlight the importance and objectives of the study. It would describe the detailed research methodology including the research design, construction and finalization of structured questionnaire, sample design, survey method and statistical tests to be used to analyze the data.

Chapter 4: Data Analysis and Interpretation

Fourth chapter would include analysis of data and interpretation of the results in order to achieve the objectives of the proposed study.

Chapter 5: Conclusion and Recommendations

The chapter would conclude the findings of the study. It would include discussions based on the findings and previous researches. Limitations of the study and future research directions would be presented in this chapter.

Chapter 6: References

The final chapter would include the list of references used for the study so far. It would enable the readers to find the sources of information provided in the current study.

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Signature of Supervisor

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